



APPALACHIAN
MOUNTAIN
ADVOCATES

Graphic: Mountain Owl © Estate of Roger Terry Pearson. All rights reserved.

P.O. Box 507
Lewisburg, WV 24901
ph: 304-645-9006
fax: 304-645-9008
email: info@appalmad.org
www.appalmad.org

5/12 449 C1171

May 1, 2015

Mr. N.J. Deiuliis
Manager
Fola Coal Company, LLC
c/o Consol Energy, Inc.
1000 Consol Energy Drive
Canonsburg, PA 15317

AT-15-000-8811

EXECUTIVE SECRETARIAT

2015 MAY 12 PM 1:25

RF

By Certified Mail – Return Receipt Requested

Re: Supplemental 60-Day Notice of Intent to File Citizen Suit Under Clean Water Act Section 505(a)(1) and (f)(5) for Violations of the Terms and Conditions of West Virginia 401 Certification at Fola Surface Mine No. 3

Dear Mr. Deiuliis:

The Sierra Club, Ohio Valley Environmental Coalition, and the West Virginia Highlands Conservancy (collectively “WV Environmental Groups”), in accordance with section 505(b)(1) of the Clean Water Act (the “Act” or the “CWA”) 33 U.S.C. § 1365(b)(1) and 40 C.F.R. Part 135, hereby notify you that Fola Coal Company, LLC (“Fola”) has violated and continues to violate “an effluent standard or limitation” under Section 505(a)(1)(A) of the Act, 33 U.S.C. § 1365(a)(1)(A) and (f)(5), by failing to comply with the terms and conditions of its CWA § 401 certification, issued by the West Virginia Department of Environmental Protection (WVDEP), in conjunction with Fola’s § 404 permits, issued by the U.S. Army Corps of Engineers (the Corps), for Fola’s Surface Mine No. 3 in the Boardtree Branch and Stillhouse Branch watersheds in West Virginia. If within sixty days of the postmark of this letter Fola does not bring itself into full compliance with the Act, we intend to either file a new citizen’s suit, or to amend and supplement the claims in the pending citizen suit in *OVEC v. Fola Coal Co.*, Civil No. 2:13-5006 (S.D.N.Y.). The WV Environmental Groups will seek civil penalties and declaratory and injunctive relief for Fola’s ongoing and continuing violations and an injunction compelling Fola to come into compliance with the Act.

This notice serves as a supplement to the prior notice sent by the WV Environmental Groups to Fola on December 2, 2012 for Fola’s violations of its NPDES permit under the CWA and its mining permit under the Surface Mining Control and Reclamation Act (SMCRA) at Surface Mine No. 3.

For our factual statement and description of the violations, the WV Environmental Groups incorporate by reference the attached expert report of Dr. Margaret Palmer and the Stipulation in *OVEC v. Fola Coal Co.*, Civil No. 2:13-5006, Doc. Nos. 55-1 and 52, respectively. These documents describe (1) Fola’s mining activities at Surface Mine No. 3 and discharges of high levels of ionic pollutants from Outlet 029 at that mine into Stillhouse Branch, (2) the chemical and biological conditions in downstream waters in Stillhouse Branch, and (3) the scientific evidence showing that Fola’s discharges and mining activities are causing or materially contributing to chemical and biological impairment of the downstream waters, in violation of West Virginia water quality standards set forth at 47 C.S.R. §§ 2-3.2.e & 2-3.2.i. Those standards are violated if wastes discharged from a mining operation “cause” or “materially contribute” materials “that are harmful . . . or toxic to . . . aquatic life” or that have “significant adverse impacts to the chemical . . . or biological components of

aquatic ecosystems.” The federal court in Civil No. 2:13-5006 issued a decision in January 2015 that Fola has violated those standards. Doc. No. 123. WV Environmental Groups incorporate by reference into this notice the Court’s findings and conclusions in that decision.

Fola’s stream-impacting activities at Surface Mine No. 3 were authorized by a Nationwide Permit (NWP) issued by the U.S. Army Corps of Engineers under § 404(e) of the CWA. 33 U.S.C. § 1344(e). The Corps issued authorizations under the 1991 NWP 26 for Surface Mine No. 3 on August 24, 1995, and March 8, 1996.

Before the Corps may issue a § 404 permit, it must obtain a certification from the state that the project will not violate that state’s water quality standards. 33 U.S.C. § 1341 (CWA § 401). WVDEP’s § 401 certification to the Corps for the 1991 NWPs contained certain standard conditions that must be met at mines with NWP authorizations. These standard conditions serve as federally enforceable effluent limits on Fola’s discharge from its mine into waters of the United States. 33 U.S.C. § 1365(f)(5).

Fola has violated and is violating three of those standard conditions at Surface Mine No. 3. The dates and locations of the violating discharges and mining activities are set forth in the attached expert report and stipulation, and in the Court’s January 2015 decision.

One condition is that “[t]he permittee will comply with water quality standards as contained in the West Virginia Code of State Regulations, Requirements Governing Water Quality Standards, Title 46, Series.” U.S. Army Corps of Engineers, Revised Nationwide Permits for the State of West Virginia (Sept. 4, 1992), Condition 13, p. 32. Fola’s discharges into Stillhouse Branch from Surface Mine No. 3 and its mining activities at that mine are causing or materially contributing to chemical and biological impairment of that stream, in violation of West Virginia water quality standards set forth at 47 C.S.R. §§ 2-3.2.e & 2-3.2.i.

A second condition is that “[s]poil materials from the watercourse or onshore operations, including sludge deposits, will not be dumped into the watercourse or deposited in wetlands or other areas where deposit may adversely affect surface or ground waters of the state.” *Id.* at 30, Condition 3. The spoil materials from Fola’s mining operations at Surface Mine No. 3 have adversely affected the surface waters of the state, i.e., Stillhouse Branch, by causing or materially contributing to chemical and biological impairment of that stream, in violation of West Virginia water quality standards set forth at 47 C.S.R. §§ 2-3.2.e & 2-3.2.i.

A third condition is that “[f]ill is to be clean, nonhazardous, and of such composition that it will not adversely affect the biological, chemical or physical property of the receiving waters.” *Id.* at 31, Condition 5. The fill used by Fola has adversely affected the biological, chemical and physical properties of the receiving waters, as evidenced by the fact that Stillhouse Branch downstream from its mine is biologically impaired and violates West Virginia water quality standards set forth at 47 C.S.R. §§ 2-3.2.e & 2-3.2.i.

The Clean Water Act authorizes citizens to sue “any person . . . who alleged to be in violation of . . . an effluent standard or limitation under this chapter.” 33 U.S.C. § 1365(a)(1). An “effluent standard or limitation under this chapter” is defined to include “a certification under section 1341 of this title.” *Id.*, § 1365(f)(5). A person who violates a condition in a § 401 certification is therefore in violation of the CWA and subject to a citizen enforcement action under the CWA. *Stillwater of Crown Point Homeowners Ass’n Inc. v. Stiglich*, 999 F. Supp. 2d 1111, 1124-25 (N.D. Ind. 2014); *N.C. Shellfish Growers Ass’n v. Holly Ridge Associates, LLC.*, 200 F. Supp.2d 551, 558 (E.D. N.C. 2001). Based on the available evidence, and the absence of any corrective measures taken by Fola since its mining operations began, we believe Fola’s violations are ongoing. If Fola does not cease those violations within 60 days, we intend to bring a citizen suit against Fola under Section 505(a)(1) of the Clean Water Act seeking civil penalties and injunctive relief. Be aware that this notice is sufficient to allow us to sue Fola for any post-notice violations related to the violations described herein. See generally, *Public Interest Research Group of N.J., Inc. v. Hercules, Inc.*, 50 F.3d 1239 (3rd Cir. 1995).

If Fola has taken any steps to eradicate the underlying cause of the violations described above, or if Fola believes that anything in this letter is inaccurate, please let us know. If Fola does not advise us of any remedial steps during the 60-day period, we will assume that no such steps have been taken and that violations are likely to continue. Additionally, we would be happy to meet with Fola or its representatives to attempt to resolve these issues within the 60-day notice period.

Sincerely,

J. Michael Becher
Appalachian Mountain Advocates
P.O. Box 507
Lewisburg, WV 24901
(304) 382-4798
mbecher@appalmad.org

James M. Hecker
Public Justice
1825 K Street NW, Suite 200
Washington, DC 20006
(202) 797-8600
jhecker@publicjustice.net

Counsel for:

Ohio Valley Environmental Coalition
P.O. Box 6753
Huntington, WV 25773
(304) 522-0246

The Sierra Club
85 Second Street, 2d Floor
San Francisco, CA 94105-3441
(415) 977-5680

West Virginia Highlands Conservancy
P.O. Box 306
Charleston, WV 25321
(304) 924-5802

cc (via certified mail):

Secretary Randy Huffman
West Virginia Department of Environmental Protection
601 57th Street
Charleston, WV 25304

Regional Administrator Shawn M. Garvin
U.S. Environmental Protection Agency Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Administrator Gina McCarthy
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Registered Agent
Fola Coal Company, LLC.
CT Corporation System
5400 D Big Tyler Road
Charleston, WV 25313

**IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA
AT HUNTINGTON**

**OHIO VALLEY ENVIRONMENTAL
COALITION, WEST VIRGINIA
HIGHLANDS CONSERVANCY,
and SIERRA CLUB,**

Plaintiffs,

v.

CIVIL ACTION NO. 2:13-5006

FOLA COAL COMPANY, LLC,

Defendant.

STIPULATION OF THE PARTIES

Plaintiffs and Defendants, by their counsel, stipulate to the correctness of the facts set forth in paragraphs 1-18 below and the authenticity and admissibility of the documents listed in Attachment A. With respect to data collected by the WVDEP or other third parties, Plaintiffs and Defendants agree that the data contained in this stipulation accurately reflects the reported results from those third parties; this Stipulation does not reflect an agreement as to the adequacy or accuracy of test methods and procedures used by third parties and should not be construed as a waiver of any challenge to the adequacy or accuracy of those results.

1. Fola Coal Company, LLC (Fola) owns and operates the 1742-acre Surface Mine No. 3 (the Mine) in Clay County, West Virginia.
2. Durable Rock Rill (DRF) no. 2 at the Mine covers 443 of the 481-acre drainage area in the Stillhouse Branch watershed. West Virginia Surface Mining Permit S200995, File 00000129, pdf page 171, 1996 Mining Permit Application, p. P-23, DOC1.

3. DRF No. 2 is the only valley fill in Stillhouse Branch.
4. DRF No. 2 discharges into Pond 40, which discharges through Outlet 029 into Stillhouse Branch, a tributary of Twentymile Creek. WV/NPDES Permit No. WV1014005, File 00000055, pdf page 83, Flow Line Diagram, May 5, 2008, DOC2.
5. The Mine is the only development activity in the Stillhouse Branch watershed upstream of Pond 40 and Outlet 029.
6. Fola holds the West Virginia Surface Mining Permit No. S200995 and WV/NPDES Permit WV1014005 for the Mine.
7. Fola's current WV/NPDES permit WV1014005, issued in 2009, limits discharges at the Mine from Outlet 029 into Stillhouse Branch. DOC3.
8. Fola's current West Virginia Surface Mining Permit No. S200995 was renewed in 2011 and expires on May 13, 2016. DOC4.
9. In its 1996 mining permit application for S200995 (File 00000133, pdf page 67, DOC5), Fola reported the following baseline surface water analysis at sampling site S3-2, which was at the mouth of Stillhouse Branch:

Date	Conductivity	Sulfate
12/30/94	77	9
1/25/95	51	9
2/15/95	47	4
3/16/95	48	11
4/19/95	71	22
5/25/95	104	10

10. In its 1996 Cumulative Hydrologic Impact Assessment, prior to the issuance of Fola's permit for the Mine, the upstream baseline water quality monitoring point in that branch showed sulfate concentrations of 1-18mg/l and total dissolved solids concentrations of 3-49 mg/l. S2000995, File 00000130, CHIA, p. 7, DOC6. The downstream baseline water

quality monitoring point in that branch showed sulfate concentrations of 4-22 mg/l and total dissolved solids concentrations of 10-98 mg/l. Id.

11. In samples taken between July 1998 and July 2012, WVDEP measured the conductivity (in $\mu\text{S}/\text{cm}$) and sulfate levels (in mg/L) at the mouth of Stillhouse Branch (lat 38.324325, long -81.02696667) as follows (August 26, 2013 Fola Document Response, Copy of Stillhouse Branch DEP Water Quality Data (C2495980), Bates No. STILLHOUSE000030-000044, DOC7) (see also Excel spreadsheet, WVDEP data request Twentymile 10-12.xlsx, Cross Tab WQ, lines 69-86, DOC8):

Date	Conductivity	Sulfate
7/20/1998	511	200
8/5/2003	3794	
8/12/2003	2710	
8/12/2003	2730	1756
8/12/2003	2776	1759
9/8/2003	2730	
9/8/2003	2906	1814
9/30/2003	3520	
9/30/2003	3588	2368
10/28/2003	2930	
10/28/2003	3086	2055
11/10/2003	3290	
11/10/2003	3169	2247
12/23/2003	3040	
12/23/2003	3077	2143
1/26/2004	3660	
1/26/2004	3620	2647
2/25/2004	3650	
2/25/2004	3837	2824
3/19/2004	3360	
3/19/2004	3284	2331
4/5/2004	2840	
4/5/2004	2678	1673
5/12/2004	3950	
5/12/2004	3964	2915
6/15/2004	3480	
6/15/2004	3490	2481

6/15/2004	3720	2493
10/13/2009	3736	
6/28/2011	3398	2070
9/6/2011	3428	2150
9/21/2011	3535	2550
9/21/2011	3525	
10/27/2011	3270	2120
10/27/2011	3308	
11/3/2011	3270	
11/29/2011	2749	1720
11/29/2011	2742	
12/13/2011	2740	
1/4/2012	3034	
1/10/2012	3150	2240
3/13/2012	2694	1690
4/3/2012	3374	2210
5/9/2012	2610	1590
6/20/2012	3505	2460
7/18/2012	3600	2530

12. On August 5, 2003, WVDEP measured the West Virginia Stream Condition Index (WVSCI) score and the EPA Rapid Bioassessment Protocol score at the mouth of Stillhouse Branch and found these scores to be 47 and 93 respectively. WVDEP, Gauley River Watershed TMDL Report, Appendix H, Tab Habitat and Bio Assessment Data, line 58, columns AA and AJ, DOC9.
13. In 2008, WVDEP classified Stillhouse Branch as biologically impaired and determined that ionic toxicity is the significant stressor. WVDEP, Gauley River Watershed TMDL Report, March 27, 2008, p. 37, DOC10. WVDEP stated that there was insufficient information available regarding the causative pollutants and their associated impairment thresholds for biological TMDL development for ionic toxicity at that time. WVDEP deferred biological TMDL development for ionic toxicity stressed streams, such as Stillhouse Branch, and retained those waters on the Section 303(d) list. *Id.*

14. On May 9, 2012, WVDEP measured the WVSCI at the mouth of Stillhouse Branch and found it to be 31.6. Excel spreadsheet, WVDEP data request Twentymile 10-12.xlsx, Tab Benthic metrics_Index Scores, line 14, DOC8. WVDEP also measured the GLIMPSS score at that same point and found it to be 19.61. Id.
15. Both Stillhouse Branch and Twentymile Creek downstream from that branch are listed on WVDEP's 2012 § 303(d) list of impaired waters. WVDEP, 2012 Section 303(d) List, p. 14, DOC11.
16. In monitoring reports filed with WVDEP, Fola has measured the following levels of conductivity in its discharges from Outlet 029 (August 26, 2013 Fola Document Response Nos. 1, 5, BiMonthlyAnalysis_1129(1).pdf, Bates Nos. STILLHOUSE000019-000028, DOC12):

Date	Conductivity
10/5/2011	3030
10/17/2011	3180
11/1/2011	1960
11/11/2011	3290
12/2/2011	3680
12/13/2011	2980
1/2/2012	3160
1/12/2012	3210
2/1/2012	3060
2/14/2012	3120
3/5/2012	763
3/16/2012	2370
4/2/2012	3370
4/12/2012	3430
5/2/2012	3390
5/14/2012	2620
6/4/2012	307
6/15/2012	3580
7/2/2012	3490
7/12/2012	3670
8/2/2012	3610

8/15/2012	2750
9/6/2012	3250
9/24/2012	3270
10/3/2012	3280
10/24/2012	3190
11/5/2012	1122
11/15/2012	2790
12/4/2012	2750
12/14/2012	2190

17. The article titled “How Many Mountains Can We Mine? Assessing the Regional Degradation of Central Appalachian Rivers by Surface Coal Mining,” by Bernhardt, et al., *Envtl. Science & Tech.*, July 19, 2012, analyzes 223 sites where WVDEP had measured the following amounts of specific conductance and determined the following rapid bioassessment protocol scores (DOC13):

SAMPLE ID	Stream Name	WVSCI	Conduc tivity	Total RBP Score	RBP Narrative	Latitude (UTM)	Longitude (UTM)	GLIMPSS	NEPHEM	NINTOL
17319	Scrabble Creek	47.53	798	75	Marginal	38.171608	-81.212411	29.3	2	3
20471	Spanker Branch	54.54	36	78	Marginal	37.784472	-81.371656	46.57	3	7
30916	Odell Fork	98.81	172	81	Marginal	38.242056	-82.528708	86.19	7	15
2746	Queens Creek	83.15	77	83	Marginal	38.191894	-82.576939	77.66	11	12
11097	Seng Camp Creek	73.79	235	83	Marginal	37.910383	-81.805403	43.81	6	3
3493	Camp Branch	49.66	603	85	Marginal	37.788494	-81.938453	46.4	3	8
11213	Lick Run	43.6	559	85	Marginal	37.872192	-81.320889	31.28	1	1
20466	White Oak Branch	59.88	42	87	Marginal	37.707753	-81.476358	52.8	6	10
17318	Scrabble Creek	30.64	1040	88	Marginal	38.166028	-81.193611	24.83	3	2
2745	Sugar Branch	59.31	168	89	Marginal	38.194056	-82.579019	54.72	6	7
3373	East Fork/Twelve pole Creek	55.51	130	92	Marginal	37.924567	-82.1873	38.79	4	5
10407	Bulwark Branch	54.99	121	92	Marginal	37.92205	-82.148747	44.44	7	4
2730	Rocklick Branch	70.81	146	97	Marginal	38.266933	-82.531508	40.58	4	6
3488	Cow Creek	35.66	578	97	Marginal	37.747136	-82.002956	27.53	2	3

35264	Blue Creek	50.95	69	97	Marginal	38.363	-81.251028	18.58	1	2
3623	Crane Fork	49.3	749	98	Marginal	37.740111	-81.535858	32.03	1	4
11047	Big Horse Creek	56.16	1739	98	Marginal	38.136678	-81.895408	28.77	0	4
27065	Plymale Branch	62.24	270	98	Marginal	38.351944	-82.470797	58.18	6	9
5330	Pointlick Fork	44.64	679	102	Marginal	38.30935	-81.475261	30.18	1	3
11201	Stonecoal Branch	50.73	490	102	Marginal	37.954528	-81.430411	30.51	0	4
17394	Brushy Fork	67.24	112	103	Marginal	38.419167	-80.78515	58.53	1	11
3616	Cabin Branch	48.15	171	104	Marginal	37.668142	-81.575269	38.32	4	4
20461	UNT/Richardson Branch RM 1.07	90.6	29	104	Marginal	37.714833	-81.340886	80.97	6	25
11193	Clear Fork	74.36	486	105	Marginal	37.867581	-81.318297	54.16	3	6
27107	Lynn Creek	21.62	269	105	Marginal	38.305775	-82.467156	21.1	2	4
3374	Twomile Creek	62.42	140	107	Marginal	38.177028	-82.428314	58.19	10	10
20457	Boardtree Run	62.43	188	107	Marginal	38.524425	-81.572489	50.07	5	10
11170	Maple Meadow Creek	57.43	586	108	Marginal	37.777392	-81.374856	35.88	4	3
11089	Skin Poplar Branch	70.32	704	110	Sub-Optimal	37.886667	-81.748089	64.65	3	12
31918	Horsemill Branch	38.64	651	110	Sub-Optimal	38.221889	-81.427056	28.62	3	4
11052	Little Horse Creek	59.42	1386	112	Sub-Optimal	38.155289	-81.859958	27.92	2	2
11096	Left Fork/Beech Creek	23.37	2553	112	Sub-Optimal	37.905414	-81.846064	15.4	0	2
20539	Sweetwood Hollow	73.52	70	112	Sub-Optimal	37.930281	-81.187744	49.93	4	9
11120	Cow Creek	63.49	1131	113	Sub-Optimal	37.890167	-81.673278	31.21	1	4
11196	Sycamore Creek	64.49	317	113	Sub-Optimal	37.950669	-81.437892	42.31	7	4
20488	Missouri Creek	72.88	180	113	Sub-Optimal	38.519683	-80.595983	63.31	7	11
21	Adkin Branch	57.46	306	114	Sub-Optimal	37.366783	-81.546769	49	3	4
11162	Rock Creek	66.78	377	115	Sub-Optimal	37.850861	-81.450831	43.62	4	5
27054	Jenny Branch	82.49	444	115	Sub-Optimal	37.516003	-81.482886	51.53	2	11
2541	Laurel Creek/Glade Creek	53	38	116	Sub-Optimal	37.960944	-80.918706	27.65	1	4
10480	Jimmy Fork	97.75	65	117	Sub-Optimal	38.178569	-81.768906	90.7	11	23
11101	Garland Fork	71.61	343	117	Sub-Optimal	37.850025	-81.806781	46.08	2	7

27016	Indian Creek	58.19	755	117	Sub-Optimal	37.487894	-81.521517	38.12	4	4
27164	Fivemile Fork	66.65	90	117	Sub-Optimal	38.352711	-81.462872	58.19	5	14
30914	Coal Branch	96.67	67	117	Sub-Optimal	37.981022	-81.832533	77.74	8	21
11137	Left Fork/Joes Creek	66.93	1016	118	Sub-Optimal	38.122214	-81.5982	39.68	4	6
20459	Clear Fork	84.36	347	118	Sub-Optimal	37.722331	-81.544	69.66	6	15
30924	Packs Branch	87.19	76	118	Sub-Optimal	37.898003	-81.205075	62.69	5	16
20	Left Fork/Sandlick Creek	54.75	787	120	Sub-Optimal	37.336544	-81.537497	34	2	1
10618	Jarrett Branch	47.61	591	120	Sub-Optimal	38.140358	-81.267522	27.24	2	4
17410	Little Laurel Creek	72.35	19	120	Sub-Optimal	38.217725	-80.556419	59.97	8	8
3480	Rockhouse Branch	36.91	337	121	Sub-Optimal	37.859822	-82.076242	39.28	4	8
5322	Dry Branch	79.83	119	121	Sub-Optimal	38.326769	-81.544842	72.31	5	16
10400	Hoover Fork	89.43	183	121	Sub-Optimal	37.950489	-82.161297	79.84	9	13
26027	Floyd Creek	52	86	121	Sub-Optimal	37.994144	-80.938128	44.82	1	10
10409	Queens Creek	95.59	103	122	Sub-Optimal	38.192336	-82.539908	90.81	11	16
11098	Pigeonroost Branch	62.85	251	122	Sub-Optimal	37.883044	-81.8149	50.54	3	10
11139	Sandlick Creek	60.52	679	122	Sub-Optimal	38.093464	-81.639511	33.02	3	4
11131	Honeycamp Fork	70.57	743	124	Sub-Optimal	38.151742	-81.724153	52.74	1	11
11206	Toney Fork	23.12	1496	124	Sub-Optimal	37.9158	-81.343769	20.78	0	3
11147	Elk Run	63.17	887	126	Sub-Optimal	37.982797	-81.537256	27.3	3	4
34979	Morris Fork	77.73	348	126	Sub-Optimal	38.355083	-81.350972	50.56	6	6
130	Upper Shannon Branch	28.56	241	127	Sub-Optimal	37.453533	-81.5996	55	5	5
3364	Spruce Fork	88.23	58	127	Sub-Optimal	37.968064	-82.355758	83.53	8	17
3372	East Fork/Twelve pole Creek	51.2	111	127	Sub-Optimal	37.947236	-82.214972	44.47	8	4
35578	Boardtree Run	62.32	290	127	Sub-Optimal	38.523528	-81.574	47.71	5	6
10382	Stover Fork	67.48	418	128	Sub-Optimal	37.870722	-81.342908	35.96	1	4
30801	UNT/Finney Branch RM 1.88	85.9	217	128	Sub-Optimal	38.388956	-81.756319	81.23	7	15
30909	Smithers Creek	86.26	97	128	Sub-Optimal	38.214417	-81.247942	71.14	3	14

10490	UNT/Rush Creek RM 0.7	79.47	75	129	Sub-Optimal	38.252411	-81.588672	56.2	4	16
11207	Toney Fork	42.87	1464	129	Sub-Optimal	37.90975	-81.336389	30.14	0	3
16840	UNT/Left Fork RM 0.36/Beaver Creek	91.69	21	129	Sub-Optimal	37.708117	-81.1346	62.69	7	10
20633	Breeden Creek	19.78	97	129	Sub-Optimal	37.901567	-82.288394	15	2	1
35333	Leatherwood Creek	61.01	2445	129	Sub-Optimal	38.390028	-81.087222	29.61	0	3
10605	Leatherwood Creek	49.25	350	130	Sub-Optimal	38.548125	-81.530817	46.87	5	2
11086	Spruce Laurel Fork	56.09	280	130	Sub-Optimal	37.910886	-81.744669	32.42	1	5
11161	Dry Creek	78.32	138	130	Sub-Optimal	37.860331	-81.463858	53.04	8	6
3317	Beech Fork	28.18	134	131	Sub-Optimal	38.318083	-82.435875	19.49	1	3
3389	Parker Branch	39.52	834	131	Sub-Optimal	38.018814	-82.251144	34.41	3	5
30810	Wilson Branch	89.64	260	131	Sub-Optimal	38.097389	-81.165186	75.41	5	17
3481	Whitman Creek	45.43	414	132	Sub-Optimal	37.824633	-82.030208	32.72	3	4
11116	West Fork/Pond Fork	53.52	847	132	Sub-Optimal	37.898858	-81.597414	33.24	1	5
11203	Fulton Creek	63.46	641	132	Sub-Optimal	37.940169	-81.380611	40.49	2	5
20482	Little Pinnacle Creek	49	140	132	Sub-Optimal	37.461286	-81.381964	28.47	2	3
27086	Right Fork/Robins on Fork	49.37	1930	132	Sub-Optimal	38.311067	-81.015367	28.41	0	2
11192	Clear Fork	68.77	751	133	Sub-Optimal	37.897	-81.344408	36.03	2	7
11059	Lick Creek	49.33	989	134	Sub-Optimal	38.085989	-81.857678	31.88	3	3
11088	Sycamore Fork	45.53	2257	134	Sub-Optimal	37.911575	-81.743758	29.53	2	5
30952	Hunt Hollow	95.65	79	134	Sub-Optimal	38.281181	-81.475169	78.66	6	18
31928	Left Fork/Kellys Creek	70.83	546	134	Sub-Optimal	38.262528	-81.374583	37.96	4	4
3393	Little Milam Creek	74.74	140	135	Sub-Optimal	38.034842	-82.326117	57.08	7	11
3484	Dingess Fork	74.86	352	135	Sub-Optimal	37.829542	-82.114775	49.66	6	7
3485	Mill Creek	59.15	216	135	Sub-Optimal	37.809714	-81.999286	43.43	5	6

11055	Rock Creek	73.25	305	135	Sub-Optimal	38.098069	-81.791656	40.7	6	3
11136	Joes Creek	83.73	745	135	Sub-Optimal	38.093464	-81.559978	66.45	4	13
20462	Lick Fork	95.08	132	135	Sub-Optimal	38.006331	-81.189767	64.54	7	15
20632	Slaughter Creek	65.36	426	135	Sub-Optimal	38.183572	-81.492508	61.55	4	9
30785	Lost Run	85.34	638	135	Sub-Optimal	38.490606	-80.542892	69.1	4	17
30990	Parsley Big Branch	47.66	423	135	Sub-Optimal	37.809158	-82.374786	33.36	3	4
3513	Rockhouse Creek	61.06	817	136	Sub-Optimal	37.729358	-81.877672	35.46	2	6
30840	Bluewater Branch	93.7	77	136	Sub-Optimal	37.995514	-82.291867	84.26	10	20
3621	Franks Fork	50.46	390	137	Sub-Optimal	37.719253	-81.413156	35.06	3	2
11115	West Fork/Pond Fork	54.52	1640	137	Sub-Optimal	37.926497	-81.622806	24.03	1	0
11212	Stover Fork	78.56	847	137	Sub-Optimal	37.879111	-81.334467	55.58	3	7
31916	Kellys Creek	60.02	641	137	Sub-Optimal	38.253194	-81.377972	22.31	2	3
2498	Laurel Creek	66.82	1104	139	Sub-Optimal	38.065111	-81.155517	43.44	2	6
3384	Rich Creek	80.22	70	139	Sub-Optimal	38.079461	-82.374969	70.31	8	14
10421	Mill Creek	57.58	140	139	Sub-Optimal	37.886033	-81.094761	40.87	0	11
10566	Little Laurel Creek	69.59	1006	139	Sub-Optimal	38.025103	-81.697939	58.94	1	10
11058	Left Fork/Rock Creek	60.17	293	139	Sub-Optimal	38.089772	-81.772653	45.91	4	8
11156	Birch Fork	65.81	847	139	Sub-Optimal	37.951828	-81.527444	36.78	2	6
11211	Workman Creek	62.23	1083	139	Sub-Optimal	37.899942	-81.346408	35.17	1	5
16799	Lick Creek	64.64	1039	139	Sub-Optimal	37.670772	-82.206858	40.58	1	6
17335	Lilly Branch	67.37	344	139	Sub-Optimal	38.279467	-81.1363	52.85	3	10
20507	Long Branch	86.94	175	139	Sub-Optimal	38.167417	-82.560797	79.09	7	11
20517	Lower Hensley Creek	65.32	117	139	Sub-Optimal	37.474333	-81.708192	52.08	8	7
27058	Big Jims Branch	81.16	93	139	Sub-Optimal	37.895969	-82.351639	81.82	5	23
35051	Sinnett Branch	71.7	49	139	Sub-Optimal	38.440083	-81.043111	57.31	7	9
35358	Taylor Creek	36.56	428	139	Sub-Optimal	38.451056	-80.903306	27.19	0	4
3552	UNT/Indian Creek RM 11.15	79.04	446	140	Sub-Optimal	37.502222	-81.575939	66.41	3	17
11119	Casey Creek	54.45	1163	140	Sub-Optimal	37.940825	-81.709308	40.16	3	4

11210	McDowell Branch	77.47	359	140	Sub-Optimal	37.905611	-81.351858	67.62	7	12
20551	Laurel Creek	24.09	48	140	Sub-Optimal	38.069128	-82.073794	23.33	2	3
27030	Middle Fork/Big Creek	52.09	726	140	Sub-Optimal	37.247806	-81.549	31.7	1	5
30865	Slippery Gut Branch	40.36	1437	140	Sub-Optimal	38.110269	-81.851628	31.86	5	4
10445	Moses Fork	92.84	47	141	Sub-Optimal	37.954033	-82.388181	79.69	9	17
2459	Pigeon Creek	66.32	343	142	Sub-Optimal	37.335319	-80.950286	45.37	7	7
3490	Fort Branch	82.96	125	142	Sub-Optimal	37.853494	-81.947067	71.49	7	12
10405	Laurel Fork/Coal Fork	90.34	585	142	Sub-Optimal	38.086075	-81.472836	63.67	6	14
11043	Little Hewitt Creek	78.44	406	142	Sub-Optimal	38.162239	-81.844908	66.33	1	14
11135	Joes Creek	68.24	845	142	Sub-Optimal	38.122075	-81.598283	38.21	3	5
20549	Sycamore Fork	19.5	1450	142	Sub-Optimal	37.896244	-81.735728	15.44	1	2
3508	Huff Creek	74.77	554	143	Sub-Optimal	37.750058	-81.677233	50.88	8	4
11087	Spruce Laurel Fork	84.72	302	143	Sub-Optimal	37.837667	-81.728839	70.57	7	14
16772	Wiley Spring Branch	59.92	19	143	Sub-Optimal	37.565006	-81.234542	46.04	4	7
16895	Hopkins Fork	67.28	406	143	Sub-Optimal	38.018664	-81.620228	57.19	5	8
20508	Brushy Fence Fork	84.3	101	143	Sub-Optimal	38.467683	-80.847014	61.38	3	16
20538	UNT/Billy Creek RM 0.32	85.83	130	143	Sub-Optimal	38.255903	-82.010575	75.16	7	13
30941	Lower Creek	93.59	203	143	Sub-Optimal	38.178994	-81.368594	62.79	6	15
34981	Morris Fork	76.15	303	143	Sub-Optimal	38.332194	-81.358917	66.79	3	10
36388	Foster Hollow	98.09	69	143	Sub-Optimal	38.159028	-81.660944	80.73	9	20
2252	Fall Branch	78.35	121	144	Sub-Optimal	37.748339	-80.928892	62.09	6	12
3321	Stowers Branch	89.18	110	144	Sub-Optimal	38.294075	-82.421575	68.18	6	12
11155	Little Marsh Fork	68.39	968	144	Sub-Optimal	37.951858	-81.527394	36.6	3	4
2405	East River	69.48	454	145	Sub-Optimal	37.333439	-80.965247	41.42	4	4
2540	Fern Creek	71.1	28	145	Sub-Optimal	38.0625	-81.053492	48.81	1	9
11133	Drawdy Creek	75.91	1106	145	Sub-Optimal	38.138042	-81.681153	37.64	2	3
20627	Gragston Creek	52.64	130	146	Sub-Optimal	38.198086	-82.515297	38.52	4	6

20644	Long Branch	57.7	593	146	Sub-Optimal	38.050108	-81.378942	37.2	0	8
27138	Cedar Creek	55.62	255	146	Sub-Optimal	38.018297	-81.355581	41.7	1	9
11109	Pond Fork	57.49	883	147	Sub-Optimal	37.80425	-81.573361	24.73	2	2
11194	Rockhouse Creek	77.43	533	147	Sub-Optimal	37.963828	-81.503803	52.78	3	9
11197	Sycamore Creek	82.95	161	147	Sub-Optimal	37.904	-81.405439	70.93	7	15
30811	Indian Creek	67.16	694	147	Sub-Optimal	37.505972	-81.572139	37.45	2	4
3543	Trace Fork	70.04	56	148	Sub-Optimal	37.58005	-81.715614	53.61	3	12
30804	Littles Creek	69.9	680	148	Sub-Optimal	37.720167	-82.003986	49.99	5	6
30835	Moore Fork	82.49	103	148	Sub-Optimal	38.593464	-81.0019	90.08	10	14
31922	Bufflick Branch	46.46	811	148	Sub-Optimal	38.239278	-81.406111	37.51	0	5
3542	Brickle Branch	85.15	43	149	Sub-Optimal	37.601	-81.723725	76.73	4	18
5328	Pointlick Fork	45.22	1241	149	Sub-Optimal	38.323819	-81.507761	33.93	2	2
16931	Armstrong Creek	69.08	388	149	Sub-Optimal	38.117717	-81.313833	49.76	4	5
3322	Rubens Branch	43.61	153	150	Sub-Optimal	38.292336	-82.389153	30.43	4	7
10522	UNT/Cane Fork RM 1.5	63.17	611	150	Sub-Optimal	38.077328	-81.426664	30.18	0	4
17426	Foxtree Run	69.4	18	150	Sub-Optimal	38.306142	-80.481056	50.01	4	13
30912	Younger Branch	94.74	64	150	Sub-Optimal	38.332739	-81.530483	78.26	8	18
3363	Long Branch	87.78	56	151	Sub-Optimal	37.982875	-82.355147	76.07	9	15
30824	UNT/Cherry River RM 9.27	96.46	62	151	Sub-Optimal	38.218364	-80.539367	82.51	8	17
30868	Surbaugh Creek	92.98	23	151	Sub-Optimal	38.011925	-80.801064	87.83	9	22
34976	UNT/Whiteoak Fork RM 1.33	60.15	288	151	Sub-Optimal	38.349889	-81.399056	41.87	0	4
20440	Clark Branch	80.63	41	152	Sub-Optimal	37.526786	-81.172319	66.33	8	14
30973	Nettle Run	93.36	18	152	Sub-Optimal	38.202003	-80.644003	79.58	7	16
17337	Hardway Branch	71.15	215	153	Sub-Optimal	38.308075	-81.061517	44.91	2	9
27116	Vall Creek	91.39	53	153	Sub-Optimal	37.236503	-81.682831	78.82	11	17
16781	Laurel Branch	69.24	408	154	Sub-Optimal	37.287475	-81.493547	59.55	5	12
27361	Laurel Fork	69.41	294	154	Sub-Optimal	37.699753	-81.479358	39.46	4	3
20503	Red Spring Creek	87.81	20	155	Sub-Optimal	37.881306	-80.913956	73.96	7	18

29628	Right Fork/Sycamore Creek	83.2	139	155	Sub-Optimal	37.935031	-81.429692	75.46	8	15
31925	Big Hollow	67.5	445	155	Sub-Optimal	38.247444	-81.388639	49.22	2	5
2259	New River (Lower)	85.12	195	156	Sub-Optimal	37.853175	-81.074819	85.55	10	11
2558	Buffalo Creek	75.53	140	156	Sub-Optimal	37.914556	-81.019819	62.6	5	11
16934	Armstrong Creek	57.98	344	156	Sub-Optimal	38.067167	-81.337081	37.25	4	6
17336	Ash Fork	92.1	50	156	Sub-Optimal	38.289667	-81.114858	79.88	6	16
17382	Hominy Creek	71.53	158	156	Sub-Optimal	38.196833	-80.768456	50.6	7	9
17405	Little Laurel Creek	82.19	42	156	Sub-Optimal	38.246192	-80.688125	66.65	8	11
17406	Panther Creek	92.67	44	156	Sub-Optimal	38.229144	-80.664844	83.28	9	22
112	Vall Creek	87.49	39	157	Sub-Optimal	37.235944	-81.682331	81.35	6	13
16774	Slickrock Branch	88.27	159	157	Sub-Optimal	37.736611	-81.651614	72.63	7	13
17424	Cranberry River	84.09	27	157	Sub-Optimal	38.308422	-80.482028	89.91	10	17
35348	Big Branch	81.43	525	157	Sub-Optimal	38.409611	-81.040667	67.17	2	12
11195	Rockhouse Creek	75.27	659	158	Sub-Optimal	37.976828	-81.480892	60.04	1	7
26955	Left Fork/Skin Fork	92.1	31	158	Sub-Optimal	37.608422	-81.577658	77.58	8	17
30855	Ben Creek	27.11	1398	159	Sub-Optimal	37.565639	-81.953844	21.6	2	1
35352	Hickory Fork	78.81	114	159	Sub-Optimal	38.456889	-80.981583	64.57	7	11
36188	Gauley River	80.27	111	159	Sub-Optimal	38.225806	-81.155583	64.04	5	5
1285	Little Laurel Creek	89.96	57	161	Optimal	38.068453	-82.280144	78.66	11	19
27142	UNT/Hales Branch RM 1.13	75.2	46	161	Optimal	37.366089	-80.940244	59.19	4	15
10358	Joe Run	93.56	24	162	Optimal	38.434533	-80.267878	76.31	5	20
11159	Horse Creek	71.18	159	162	Optimal	37.872189	-81.4925	51.41	4	8
10471	UNT/Glade Creek RM 9.30	90.27	27	163	Optimal	37.937336	-80.864983	86.18	9	24
16789	Big Branch	49.3	556	163	Optimal	38.398494	-81.040608	44.29	0	8
27055	Spruce Fork	69.33	608	163	Optimal	38.018886	-81.506833	44.56	2	8
30903	Right Fork/Sweetwater Branch	87.24	58	163	Optimal	37.984733	-82.337617	84.73	7	23
2251	Pinch Creek	87.78	247	164	Optimal	37.764036	-81.043208	70.82	7	14

20669	Craig Hollow	87.23	76	164	Optimal	38.114917	-81.337333	78.22	7	16
2391	Mash Fork	90.88	79	165	Optimal	37.502586	-81.145989	77.43	6	14
17332	Rockcamp Fork	90.23	43	166	Optimal	38.301575	-81.142	85.31	5	18
27023	Hamilton Branch	61.53	217	166	Optimal	37.920364	-81.107853	45.93	1	4
30782	UNT/Big Run RM 0.80	89.49	27	166	Optimal	38.620917	-80.305242	86.06	7	19
35378	Birch River	81.23	285	167	Optimal	38.555472	-80.785361	73.31	9	7
16824	UNT/Laurel Creek RM 3.46	71.73	363	168	Optimal	38.062183	-81.635278	36.07	0	7
26978	Buckles Branch	81.31	1650	168	Optimal	38.232306	-81.206231	66.66	1	10
27353	Wiley Spring Branch	82.86	40	168	Optimal	37.554444	-81.258822	73.62	7	15
26973	Road Fork	87.58	33	169	Optimal	38.427714	-80.912153	78.04	9	17
10557	Toms Branch	90.49	26	171	Optimal	38.113972	-80.920008	69.33	8	15
27046	Sturgeon Branch	80.04	61	171	Optimal	37.645189	-81.794147	66	6	15
36418	Dry Creek	94.59	103	172	Optimal	37.87425	-81.427556	88.33	8	18
16786	Fall Branch	81.7	46	173	Optimal	37.747619	-80.947594	75.65	7	17
17420	Big Laurel Creek	71.56	26	177	Optimal	38.353892	-80.560531	70.53	7	11
26991	Glade Creek	88.65	112	178	Optimal	37.806586	-81.015397	88.26	11	17
3857	Mash Fork	88.11	44	179	Optimal	37.502617	-81.146489	84.68	7	14
10537	Davis Branch	84.29	34	185	Optimal	37.824786	-80.950594	78.27	7	22
17430	Williams River	71.16	23	185	Optimal	38.382781	-80.499308	65.5	8	6
21878	Little Fork	83.82	23	187	Optimal	38.325944	-80.374522	64.88	4	10

AGREED:

/s/ Matt Tyree

Matt Tyree

Shane Harvey

Jackson Kelly PLLC

500 Lee Street East

Charleston, WV 25301

304-340-1000

mstyree@jacksonkelly.com

sharvey@jacksonkelly.com

Counsel for Defendants

/s/ J. Michael Becher

J. Michael Becher (W.Va Bar No. 10588)

Appalachian Mountain Advocates

P.O. Box 507

Lewisburg, WV 24901

304-382-4798

mbecher@appalmad.org

Counsel for Plaintiffs

ATTACHMENT A

Doc. No.	Permit	Description	Date	Image File#	Page #s in image file
1	S200995	Permit application	1996	129	171
2	WV1014005	Flow Line Diagram	2009	55	83
3	WV1014005	Permit	2009	54	3-20
4	S200995	Permit	2011	444	2
5	S200995	Baseline Surface Water Analysis	1996	133	65-73
6	S200995	CHIA	1996	130	42-54

Doc No.	Permit	Description	Date	Source	File Name/Page	File Date
7	WV1014005	Instream monitoring	1998-2012	Fola Doc. Response	Copy of Stillhouse Branch DEP Water Quality Data (C2495980), STILLHOUSE000030-000044	12/13/13
8	WV1014005	Instream monitoring	1998-2012	WVDEP FOIA	WVDEP data request Twentymile 10-12.xlsx	10/17/12
9		Gauley TMDL Report	3/27/008	WVDEP	Gauley_Appendix_H_WQ_Data.xls	4/21/10
10		Gauley TMDL Report	3/27/008	WVDEP	Gauley_Final_TMDL_Report_03_27_08	4/16/10
11		2012 303(d) List	11/18/13	EPA	WV_2012IR_Supplements_303dLists_Only_EPA.pdf	11/18/13
12	WV1014005	Outlet 029 monitoring	2011-2012	Fola Doc. Response	BiMonthlyAnalysis_1129(1).pdf, STILLHOUSE000019-000028	11/18/13
13		WVDEP Watershed Assessment Database		WVDEP	WVDEP Watershed Assessment Database	3/21/14

**Export Report of Dr. Margaret Palmer on the Chemical and Biological Integrity of
Stillhouse Branch in Clay County, W.V.**

Margaret A. Palmer
Professor and Director
National Socio-environmental Synthesis Center
University of Maryland

January 16, 2014

Qualifications to provide expert comments: I am a Professor at the University of Maryland and Director of the National Socio-Environmental Synthesis Center where I oversee an international research center as well as a scientific research laboratory. I have over 29 years of experience in research and teaching on aquatic ecosystems and have extensive knowledge about stream ecosystem science and restoration ecology. I was the lead research scientist on a project that synthesized the status of stream and river restoration in the U.S. I have published a book on *The Foundations of Restoration Ecology* and currently have extramurally funded research programs helping in the design and assessment of stream restoration. I serve on numerous national and international panels dealing with stream and watershed science. My resume is attached.

Background: Fola Coal Company, LLC has a surface mining (WV S200995) and NPDES permit (WV1014005) associated with a 1619 acre mine in Clay County, West Virginia that impacts Stillhouse Creek which is a tributary to Twentymile Creek. The Fola No. 3 surface mine has one valley fill that covers 91% of the drainage area to Stillhouse Creek. There is no other development in the watershed except for this mine. Prior to reaching the creek, the valley fill discharges empty into a pond which in turn empties into Outlet 029 then into Stillhouse Creek (Figure 1).

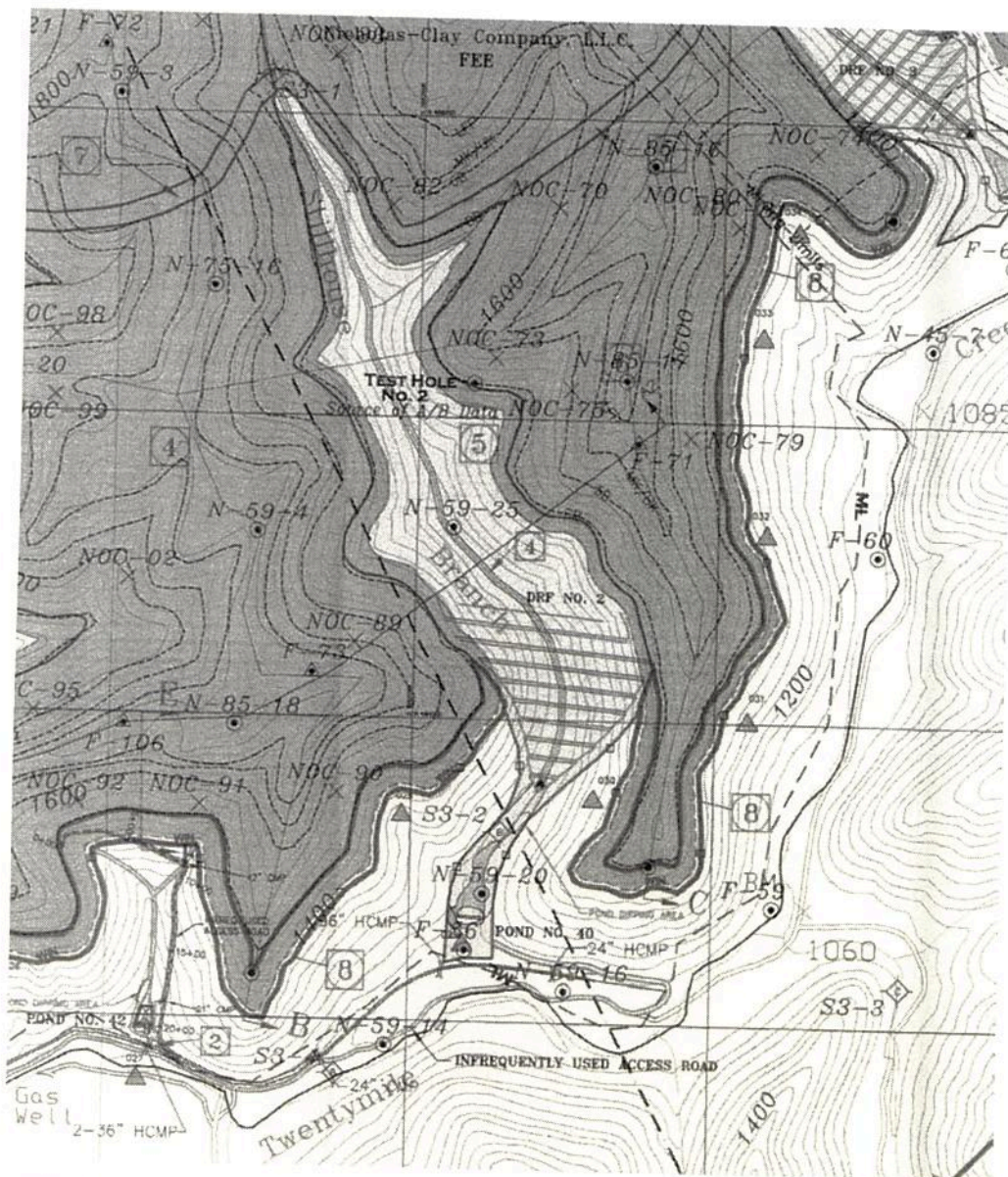


Figure 1. Diagrammatic map of the mining area. In yellow is the valley fill, in blue the pond, and the discharge point from the pond is the bright yellow triangle. (from: 2004 Fola permit amendment application)

Data collected:

I visited the Fola mine on January 9, 2014 and took in-stream measurements of conductivity, temperature, and oxygen (Table 1). I also walked the stream making visual observations of the bank, streambed, and outfall area. Immediately below the pond, the channel is concrete lined designating the outfall; immediately below that there is a small pool and the water was dilute milky n color (Appendix 1, Photo 1). There were no signs of excessive sedimentation despite some degraded bank structures but there were quite visible deposits of precipitates (especially orange) on the rocks (Appendix 1, Photo 5). The pebble area in between larger rocks also had such deposits and in multiple places the center channel or thalweg was noticeably embedded such that kicking with the foot did not result in any re-suspension.

Table 1. Measurements of water quality taken by M. Palmer on 1/9/2014 in Stillhouse Branch near Clay WV.	
Stillhouse Branch	January 9, 2014
Oxygen (% saturation)	100
Conductivity (us/cm)	1760
temperature (°C)	7.4

Rocks were randomly collected from the streambed at Stillhouse and placed in two glass containers with reverse-osmosis filtered water. These rocks had deposits on them like others in the stream. Prior to placing rocks in this water, conductivity was ~ 17 uS/cm varying very little by replicate. Rocks were also randomly collected from Road Fork of Rockcamp Branch which is a stream in an unmined watershed, north of Vaughan, W.V. (hereafter, "reference" site); they were also placed in two containers filled with reverse-osmosis filtered water. Conductivity readings were taken over time in each of the four containers (2 containers with Stillhouse rocks; 2 containers with Road Fork rocks). Photos in the appendix.

Water quality impacts. Before traveling to Fola's Surface Mine No. 3, I examined water quality analyses and habitat assessments of Stillhouse Branch from past records. No parameter other than conductivity looked particularly problematic or would explain the degree of biological impairment measured in the stream. When I visited the site myself, I observed the watershed surrounding the sampling locations. With the exception of a nearby railroad line it was obvious that any impacts to habitat would be a direct consequence of the Surface Mine No. 3. The habitat while suboptimal, did not however appear degraded enough to explain the level of impairment measured in Stillhouse Branch.

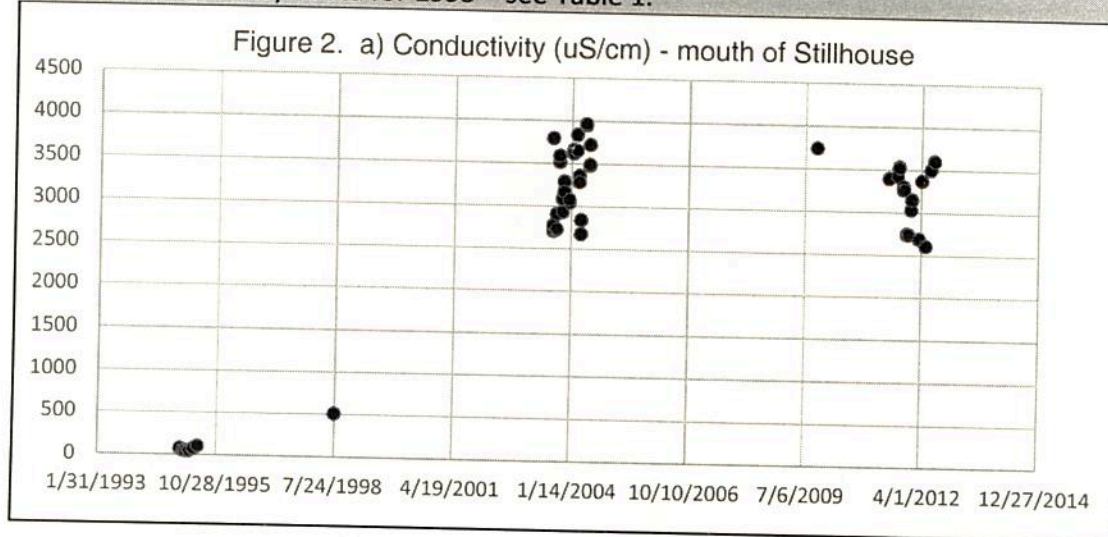
There is extensive evidence that the surface mine (Mine No. 3 of Fola) has caused elevated levels of chemical constituents that have led to water quality problems in Stillhouse Branch. Most recently, data collected by E. Hansen of Downstream Strategies showed that in Stillhouse Branch pH = 8.54, conductivity = 2826, and sulfate = 2000 in

September 2013. Prior to 1998 however (i.e. prior to mining in the watershed), the conductivity and sulfate concentrations in the stream were very low (Table 2) and within the range of unimpacted reference sites for West Virginia.

Table 2. Pre-mining data in Stillhouse		
	Conductivity (uS/cm)	SO4 mg/L
12/30/1994	77	9
1/25/1995	51	9
2/15/1995	47	4
3/16/1995	48	11
4/19/1995	71	22
5/25/1995	104	10
Data from: Page S200995 SMCRA Permit Section J 00000133		

By 1998, stream water quality in Stillhouse was already degraded (conductivity 511 uS/cm, Sulfate 200 mg/L) (Figure 2). In fact, by 2004, conductivity was as high as 3964 uS/cm and sulfate concentrations were as high as 2915 mg/L. The EPA benchmark for conductivity is 300 uS/cm (EPA 2011; Cormier et al. 2013) and thus the water quality was clearly degraded almost immediately after the mining operations began. The West Virginia DEP and others have identified sulfate concentrations of 50 mg/L as indicative of mining activity in this region and yet SO₄ concentrations in the stream were extremely high ranging from over 1500 mg/L to ~3000 mg/L. Finally, selenium concentrations in the stream have also been elevated as evidenced by samples collected by both the WVDEP and by E Hansen that spans a number of years (Figure 3).

Figure 2. Data for 1998, 2004, 2009, and 2012 are from water samples taken by the WV Department of Environmental Protection (WVDEP) at the mouth of Stillhouse Branch for a) conductivity and b) sulfate. (From: August 26, 2013 Fola Document Response, Copy of Stillhouse Branch DEP Water Quality Data (C2495980), Bates No. STILLHOUSE000030-000044) (see also Excel spreadsheet, WVDEP data request Twentymile 10-12.xlsx, Cross Tab WQ, lines 69-86). Data for 1995 – see Table 1.



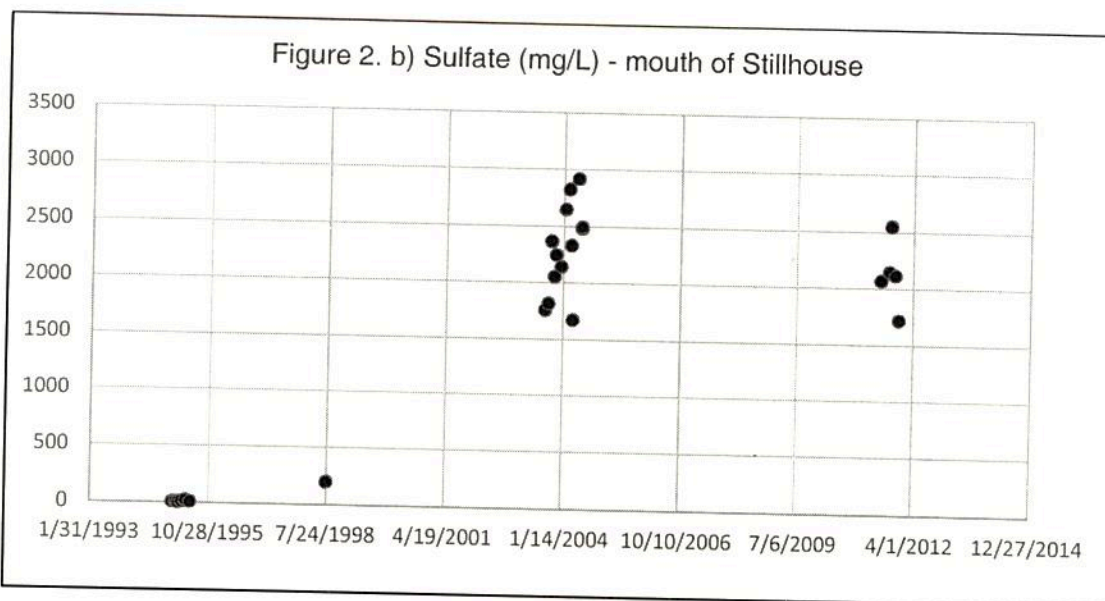
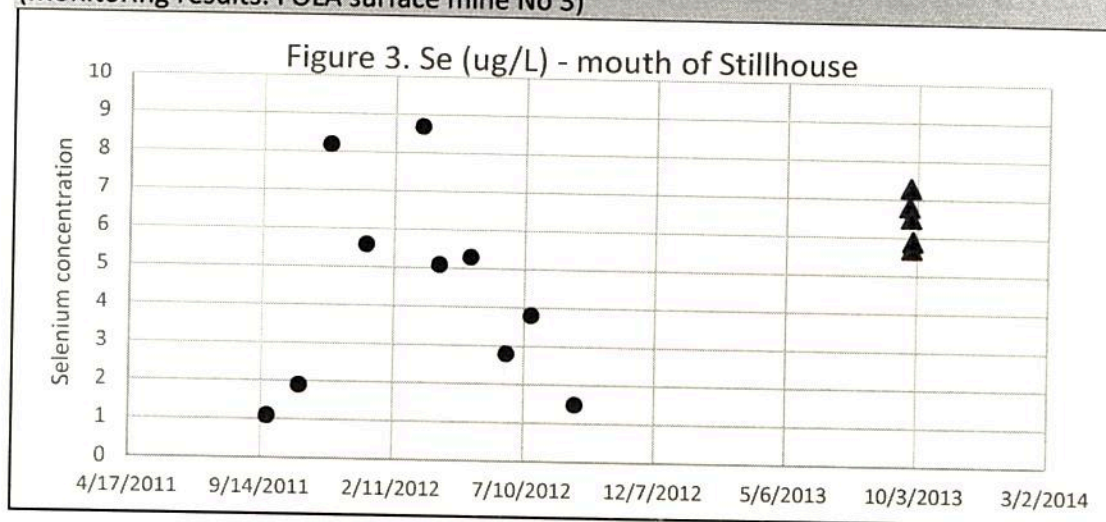
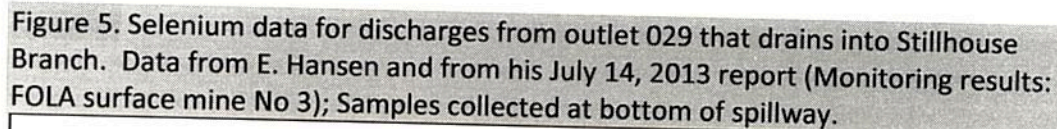


Figure 3. Selenium concentrations (ug/L) in stream water collected at the mouth of Stillhouse Branch from September 2011 – until 2012 by WVDEP (circle symbols) and in 2013 by E. Hansen (triangle symbols). (WVDEP data: August 26, 2013 Fola Document Response Nos. 1, 5, Copy of Stillhouse Branch DEP Water Quality Data (C2495980), Bates No. STILLHOUSE00029, 000044) and Hansen data in his July 14, 2013 report (Monitoring results: FOLA surface mine No 3)



Source of impacts: Since the only land use upstream is coal mining with an effluent pond below the valley fill that drains directly down a spillway in Stillhouse, the only source of conductivity, sulfate and selenium that could be causing such elevated levels in the stream is the mine site and valley fill. This is further supported by the water chemistry data from Outfall 029 which drains that pond and whose effluent is that flowing into Stillhouse. Data collected by FOLA (Figure 4) for conductivity and data

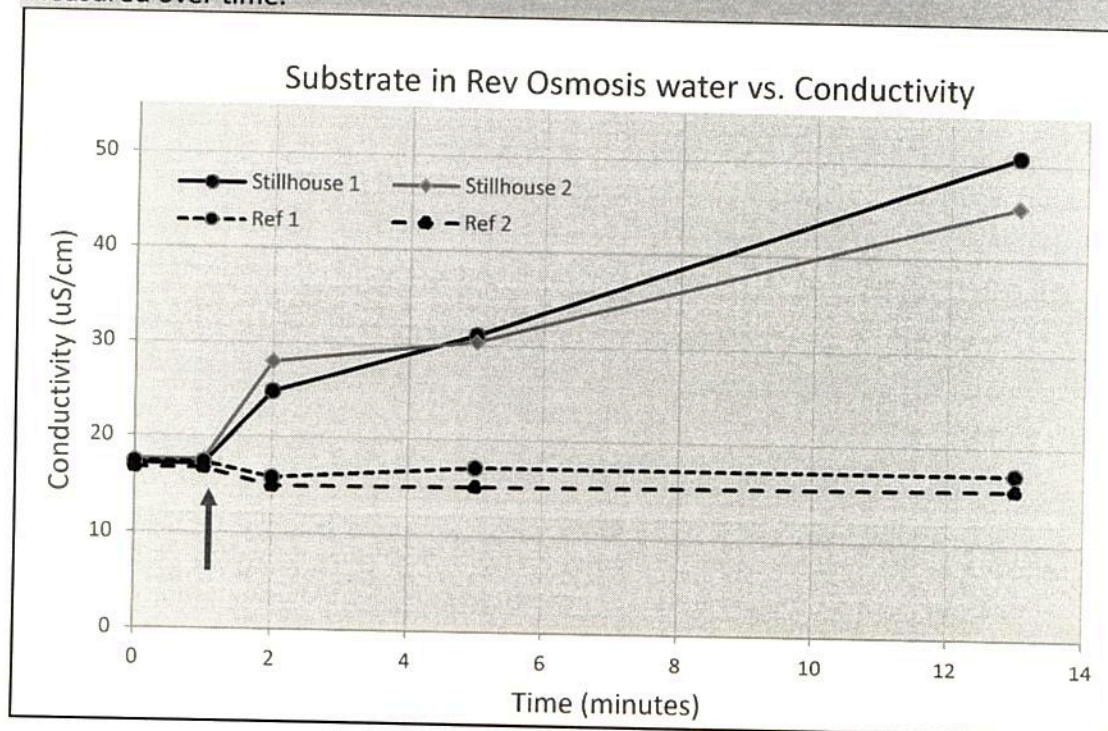
Figure 4. Conductivity (uS/cm) - Outlet 029



Date	Se concentration (mg/kg)
9/23/2013	6.2
9/25/2013	6.5
9/26/2013	5.8
9/27/2013	5.0
9/28/2013	6.0

6

Figure 6. Data collected by M Palmer from site visit to WV in January 2014. Substrates collected in Stillhouse Branch vs. a reference stream (Rockcamp Branch of Twentymile Creek) with no mining in the watershed were placed in clean glass containers with reverse osmosis derived water. Initial conductivity (time 0) was measured, substrates were placed in containers after 1 minute (red arrow on graph) then conductivity was measured over time.



Biological Impairment. Not surprisingly given the poor water quality, the biological integrity of the streams in Stillhouse is impaired. (Swan data, Appendices 2 and 3). The West Virginia Stream Condition index score reported by Dr. Swan from September 30, 2013 sampling in Stillhouse Branch was 58.17 which is well below the impairment threshold that EPA has identified as 68. Macroinvertebrates in West Virginia streams that are unimpacted are extremely diverse and exhibit a range of tolerances to pollutants (Pond 2010). They serve as an excellent tool for measuring overall ecological health and have been used routinely by the state of West Virginia and other states across the nation to evaluate and rank stream condition. The WVSCI is a multi-metric index used to evaluate the biological condition of West Virginia streams using data from the family taxonomic level. The taxonomic composition is dominated by highly tolerant taxa as predicted by the extensive work completed by Cormier et al. (2013).

Using the more precise GLIMPSS method the stream is even more obviously impaired. It scores a 27.71, which is well below any justifiable threshold based on the GLIMPSS (Pond et al. 2013). Dr. Swan found that Stillhouse Branch was dominated by tolerant taxa with only three families of EPT taxa. This is much lower than reference site streams in WV and the loss of such taxa is consistent with water quality impairment associated

with outfall inputs elevated in conductivity and sulfate. Reference streams in Appalachia that are not impacted by mining and have conductivity levels typically well below 300 uS/cm, typically have a large number of mayflies (Ephemeroptera) yet Stillhouse did not. Instead Stillhouse was dominated by caddisflies and dipterans that are among the most highly tolerant taxa in these streams.

The presence of heavy precipitates on the rocks in the stream yet little evidence of a siltation problem that would cause biological impairment of the magnitude also points toward the pollutants from mining as the cause of impairment. The habitat assessments that were performed by Dr. Swan did not find a RPB habitat result (RBP total score = 130) sufficiently poor to cause biological impairment of the magnitude found in this stream. Tetratich (2000) identified 120 as the RBP score that would reflect impairment and this was supported with a rigorous scientific analysis and explanation. The Stillhouse score is clearly above this. Furthermore, the siltation submetric within the RPB assessment is recognized as particularly important (WVDEP 2012) and is not a problem in Stillhouse.

Swan reported fine organic matter was abundant in places which is perfectly normal for a healthy stream and is even a source of food for organisms. Silt and clay were so low as to not even be quantified by Dr. Swan in his RBP data sheet; instead the % composition of the streambed was: 5% boulder, 25% cobble; 50% gravel; and 20% sand. This composition combined with the flow status indicates diverse streambed habitat.

Conclusions: Based on all the data provided to me on Stillhouse Branch and Outfall 029 from Fola Mine No. 3, there is indisputable scientific evidence that the mining operation and valley fill at the Fola site are causing significant impairment to Stillhouse Branch. Levels of chemical pollution are very high and biological impairment is serious, yet habitat and other factors were not sufficiently poor to have caused the level of biological impairment.

A significant body of scientific research has clearly shown that levels of conductivity above ~ 300 uS/cm and elevated sulfate levels are common below Appalachian mine sites and lead to extirpation of invertebrate genera (EPA 2011; Cormier and Suter 2013; Cormier et al. 2013a) and that the ions found coming out of Outfall 029 and in Stillhouse are consistent with those associated with coal mining pollution in this region (Pond et al. 2008; Palmer et al. 2010; Bernhardt and Palmer 2011; Lindberg et al. 2012; Pond et al. 2012; Pond et al. 2013). The ionic mixture of calcium, magnesium, sulfate, and bicarbonate in circumneutral mine water causes the loss of aquatic macroinvertebrates in Appalachian areas where surface coal mining is prevalent; it is the mixture of ions that causes the biological impairment (Cormier et al. 2013b; Cormier and Suter 2013).

Suter and Cormier (2013) also examined potential confounding factors and determined that they did not affect the findings that the drainage from mines such as Mine No. 3 causes biological impairment; the factors they evaluated include habitat, siltation (fine

sediment deposits on the streambed), area of the watershed, elevated levels of selenium and other metals, and ponds.

References

- Bernhardt, E. S. and M.A. Palmer. 2011. The environmental costs of mountaintop mining valley fill operations for aquatic ecosystems of the Central Appalachians. *Year Ecol. Conserv. Biol.* 2011, 1223, 39–57.
- Cormier et al 2013a. (Cormier SM, Suter GWII, and Zheng L). 2013. Derivation of a benchmark for freshwater ionic strength. *Environ Toxicol Chem* 32:263–271.
- Cormier S. and G.W. Suter. 2013. A method for assessing causation of field exposure-response relationships. *Environ Toxicol Chem* 32:272–276
- Cormier et al. 2013b. (Cormier, S.M., G.W. Suter, L. Zheng, and G. J. Pond. 2013. Assessing causation of the extirpation of stream macroinvertebrates. *Environmental Science and Technology* 32(2): 277-287.
- EPA. 2011. A Field-based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams; EPA/600/R-10/023F; Office of Research and Development, National Center for Environmental Assessment: Washington, DC, 2011. Available online from <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=220171>
- Lindberg, T. T., E.S. Bernhardt, R. Bier, A.M. Helton, R.B. Merola, A. Vengosh, and R.T. Di Giulio. 2012. Cumulative impacts of mountaintop mining on an Appalachian watershed. *Proc. Natl. Acad. Sci. U.S.A.* 108 (52): 20929–20934.
- Palmer, M. A.; E.S. Bernhardt, W.H. Schlesinger, K.N. Eshleman, E. Foufoula-Georgiou, M.S. Hendryx, A.D. Lemly, A. D., G.E. Likens, O.L. Loucks, O. L., M.E. Power, P. White, and P. R. Wilcock. 2010. Mountaintop Mining Consequences. *Science* 327 (5962): 148–149.
- Pond, G. J., M.E. Passmore, F.A. Borsuk, L. Reynolds, C.J. Rose, C. J. 2008. Downstream effects of mountaintop coal mining: comparing biological conditions using family- and genus-level macroinvertebrate bioassessment tools. *J. North Am. Benthological Soc.* 27 (3): 717–737.
- Pond, G. 2010. Patterns of Ephemeroptera taxa loss in Appalachian 3 headwater streams (Kentucky, USA) *Hydrobiologia*. 641: 185–201
- Pond, G. 2012. Biodiversity loss in Appalachian headwater streams: Plecoptera and Trichoptera communities. *Hydrobiologia* 679: 97-117.

Pond, G.J., J.E. Bailey, B.M. Lowman, and M.H. Whitman. 2013. Calibration and validation of a regionally and seasonally stratified macroinvertebrate index for West Virginia wadeable streams. *Environ. Monitoring Assess* 185:1515–1540.

Suter, G.W. and S.M. Cormier. 2013. A method for assessing the potential for confounding applied to ionic strength in central Appalachian streams. *Environmental Toxicology & Chemistry* 32: 288-295.

Tetrattech. 2000. A stream condition index for West Virginia wadeable streams. http://www.dep.wv.gov/WWE/watershed/bio_fish/Documents/WVSCI.pdf

WVDEP 2012. Final West Virginia integrated water quality monitoring and assessment. [http://www.dep.wv.gov/WWE/watershed/IR/Documents/IR_2012_Documents/EPA Approved Narrative.pdf](http://www.dep.wv.gov/WWE/watershed/IR/Documents/IR_2012_Documents/EPA_Approved_Narrative.pdf)

I declare under penalty of perjury that the foregoing is true and correct.

Date: January 16, 2014
Margaret A. Palmer



Qualifications as an Expert Witness: see attached curriculum

Appendix 1. Photos from the January 9, 2014 field survey by M. A. Palmer at FOLA mine. The stream is Stillhouse Branch.

Photo 1.

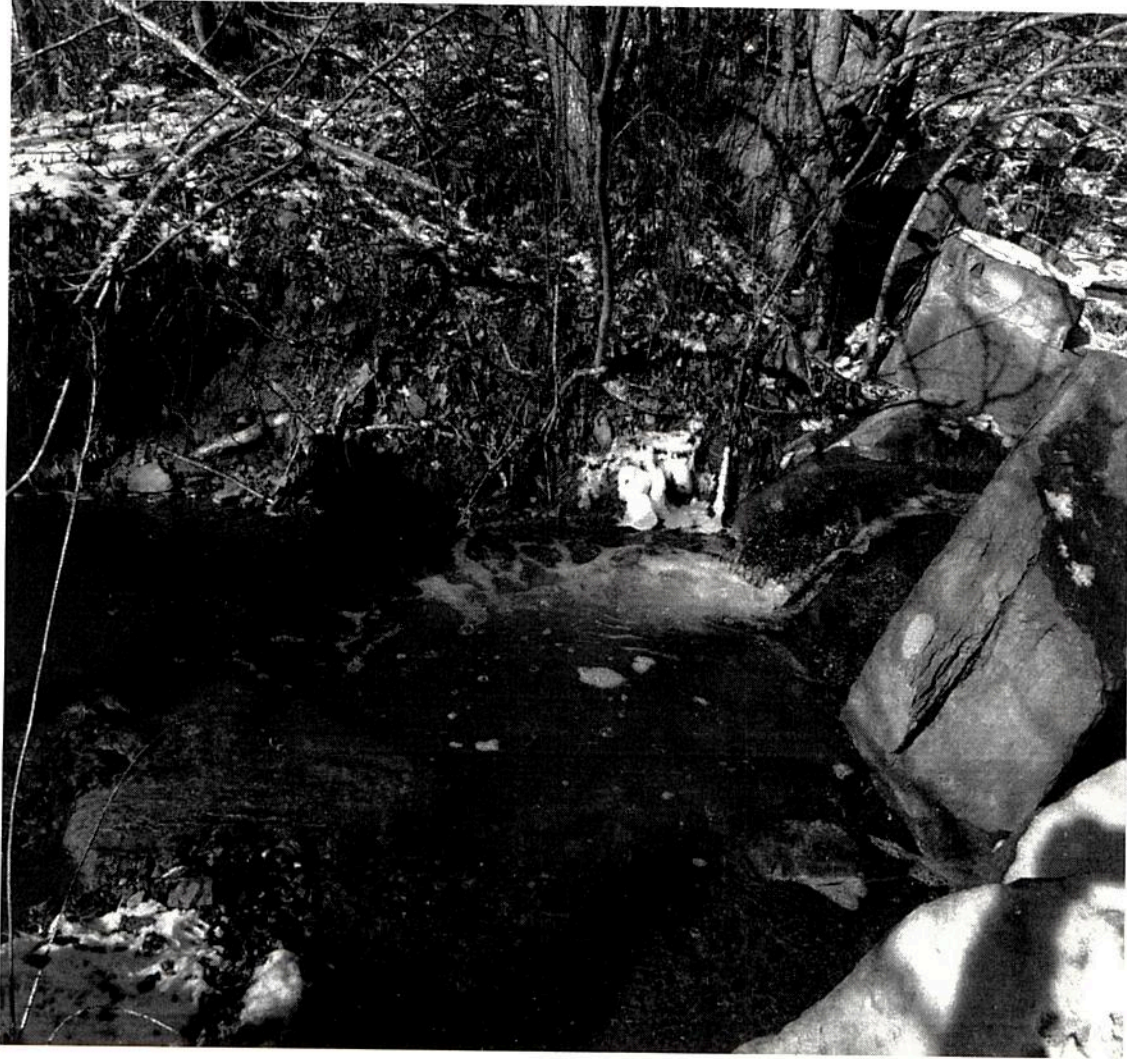
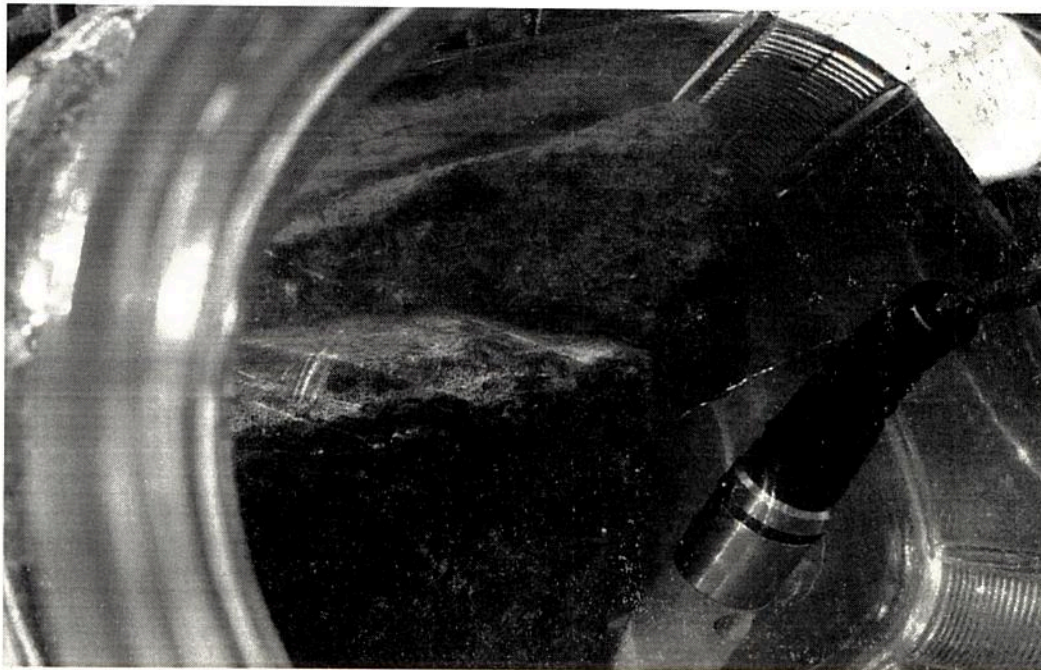


Photo 4.



Photo 5.



Appendix 2. Chris Swan benthic data from Sept 30, 2013 sampling – Family level

SPECIES	T.V.	F.F.G.	CL	Stillhouse
MOLLUSCA				
Gastropoda				
Basommatophora				
Lymnaeidae	7	SC		2
ANNELIDA				
Oligochaeta	10	CG		
Enchytraeidae	10	CG		
ARTHROPODA				
Arachnoidea				
Acariformes	6	P		
Insecta				
Collembola				
Isotomidae	9	OM		1
Plecoptera				
Capniidae/Leuctridae	2	Sh		1
Capniidae	1	SH		
Perlidae	1	P		
Megaloptera				
Corydalidae	5	P		1
Trichoptera				
Hydropsychidae	4	FC	CL	78
Hydroptilidae	4	PI		31
Philopotamidae	3	FC	CL	
Rhyacophilidae	3	P	CL	
Coleoptera				
Elmidae	4	CG		1
Diptera				
Chironomidae	6	CG		6
Empididae	6	P		12
Simuliidae	6	FC		38
Tipulidae	3	SH		
TOTAL NO. OF ORGANISMS				171
TOTAL NO. OF TAXA				10
EPT FAMILIES				3
%EPT				64.33%
% CHIRONOMIDAE				3.51%
%2 DOMINANT FAMILIES				67.84%
^aFAMILY LEVEL HBI				4.71
MBI maximum 25 individuals per taxa				4.97
STATION SCI SCORE				60.27

Appendix 3. Chris Swan benthic data from Sept 30, 2013 sampling – Species level

				PA 44488
SPECIES	T.V.	F.F.G.	CL	Stillhouse
MOLLUSCA				
Gastropoda				
Basommatophora				
Lymnaeidae		SC		
<i>Fossaria sp.</i>	7	SC		2
ANNELIDA				
Oligochaeta	10	CG		
Enchytraeidae	10	CG		
ARTHROPODA				
Arachnoidea				
Acariformes	6	P		
Insecta				
Collembola				
Isotomidae	9	OM		1
Plecoptera				
Capniidae/Leuctridae	2	SH		1
Capniidae	1	SH		
Perlidae	1	P		
<i>Eccoptura xanthenes</i>		P	CL	
Megaloptera				
Corydalidae	5	P	CL	
<i>Nigronia serricornis</i>	5	P	CL	1
Trichoptera				
Hydropsychidae	4	FC	CL	25
<i>Ceratopsyche sparna</i>		FC	CL	1
<i>Cheumatopsyche sp.</i>	6	FC	CL	1
<i>Hydropsyche sp.</i>	4	FC	CL	51
<i>Hydropsyche depravata gp.</i>	4	FC	CL	
Hydroptilidae	4	PI		
<i>Hydroptila sp.</i>	6	PI	CL	31
Philopotamidae	3	FC	CL	
<i>Chimarra sp.</i>	4	FC	CL	
Rhyacophilidae	3	P	CL	
<i>Rhyacophila sp.</i>	3	P	CL	
Coleoptera				
Elmidae	4	CG		
<i>Dubiraphia vittata</i>		SC	CL	1
Diptera				
Chironomidae	6	CG		
<i>Cardiocladius obscurus</i>		P	CL	1
<i>Conchapelopia sp.</i>	6	P		
<i>Cricotopus bicinctus</i>	7	CG	CL	3
<i>Cricotopus sp.</i>	7	CG	CL	2
<i>Eukiefferiella claripennis gp.</i>	8	CG		
<i>Eukiefferiella devonica gp.</i>	4	CG		
<i>Parametriocnemus sp.</i>	5	CG		

Empididae	6	P		
<i>Hemerodromia sp.</i>	6	P		12
<i>Neoplasta sp.</i>	6	P		
Simuliidae	6	FC	CL	
<i>Simulium sp.</i>	6	FC	CL	38
Tipulidae	3	SH		
<i>Tipula sp.</i>	6	SH		
TOTAL NO. OF ORGANISMS				171
TOTAL NO. OF TAXA				15
EPT				6
HBI				5.13
MBI maximum 25 individuals per taxa				5.23
M%EPT				63.74%
% EPHEMEROPTERA				n/a
%CO				3.51%
%CLINGERS				90.64%

^a Tolerance values taken from WVDEP Benthic Taxa Code List